

CLAIMS

1. A biosensor for the detection and/or the determination of freshness biomarkers, such as biogenic amines, comprising an electrode and a mono-enzyme system of an amine oxidase or a bi-enzyme system of an amine oxidase and a peroxidase, characterised in that the amine oxidase is a copper-containing amine oxidase derived from grass pea (AO, E.C. 1.4.3.6).
2. The biosensor according to claim 1, characterised in that the bi-enzyme system contains said copper-containing amine oxidase derived from grass pea coupled with horseradish, soybean, tobacco, sweet potato or palmtree peroxidase.
3. The biosensor according to claim 2, characterised in that the peroxidase is horseradish peroxidase.
4. The biosensor according to any of the preceding claims, characterised in that the mono-enzyme or the bi-enzyme system is crosslinked into an osmium based redox polymer.
5. The biosensor according to claim 4, characterised in that the osmium based redox polymer includes poly(1-vinylimidazole) complexed with $[\text{Os}(4,4'\text{-dimethyl-bi-pyridin})_2\text{Cl}]^{+/2+}$ and poly(ethylene glycol) diglycidyl-ether, as the crosslinking agent.
6. The biosensor according to any of the preceding claims, characterised in that the biosensor is of Type I, Type II or Type III type of biosensor; wherein
- Type I: the mono-enzyme or the bi-enzyme system is added direct on to the electrode surface; or
- Type II: the mono-enzyme or the bi-enzyme system is entrapped in the osmium based redox polymer added on the top of the electrode; or

Type III: the mono-enzyme or the bi-enzyme system and the osmium based redox polymer forms sequential coatings added on top of the electrode.

- 5 7. The biosensor according to claim 6, characterised in that the biosensor of Type III is one of Type III a, Type III b, Type III c or Type III d, wherein

10 Type III a: a second coating of the mono-enzyme is coating a dried layer of peroxidase and redox hydrogel; or

Type III b: a second coating of peroxidase and redox hydrogel is coating a dried layer of the mono-enzyme; or

15 Type III c: a second coating of the mono-enzyme entrapped in redox hydrogel is coating a dried layer of peroxidase; or

Type III d: a second coating of peroxidase is coating a dried layer of mono-enzyme entrapped in redox hydrogel.

20

- Sub 10 8. The biosensor according to any of the preceding claims, characterised in that the electrode is of noble metals, such as gold, silver, platinum, palladium, or carbon/graphite-based material, such as graphite, carbon paste, vitrous carbon, carbon fibres, or conducting salts, or conducting polymers
- 25

9. The biosensor according to claim 8, characterised in that the electrode is made of graphite.

30

- Sub 10 10. Use of the biosensor according to any of claims 1 to 9, as an analytical instrument or tool for the detection or determination of freshness biomarkers or of the content of freshness biomarkers in food, such as meat from animals or fishes, or beverages.

35

11. Use of the biosensor according to any of claims 1 to 9, as an analytical instrument or tool for the detection or determination of biogenic amines, preferably histamine, in body flu-

07 MARCH 2001

-18-

SUB A

ids, such as blood, urine, saliva, sweat, in medical diagnoses or in the treatment of diseases.

12. Use of the biosensor according to any of claims 1 to 9,
5 as an analytical instrument or tool for the detection or determination of biogenic amines, preferably histamine, in microdialysates or dialysates.

Add B13